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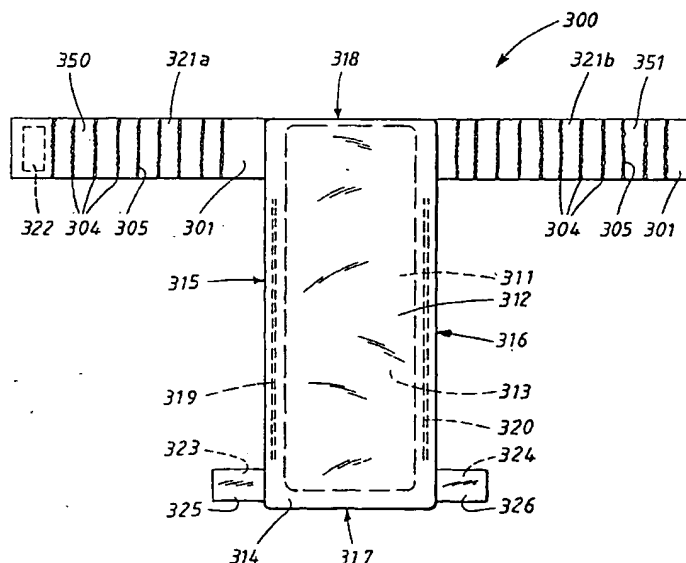
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(54) Title: ABSORBENT ARTICLE WITH WAISTBELT COMPRISING FASTENING LOOPS ARRANGED IN CHAIN-LIKE ROWS



(57) Abstract: An absorbent article with a longitudinal direction and a transverse direction (300; 500), comprising a liquid-permeable cover sheet (311; 511), a liquid-tight cover sheet (312; 512), and an absorbent body (313; 513) enclosed between the cover sheets (311, 312; 511, 512), and having two side edges (315, 316; 515, 516) extending in the longitudinal direction and two end edges (317, 318; 517, 518) extending in the transverse direction, which article comprises a waist belt (321a, b; 521) formed by at least one layer and arranged substantially parallel to an end edge (318; 518) of the article, and having members (301, 322; 501, 522) for fastening the waist belt around a user's waist, and the article comprises members (301, 325, 326; 501, 525, 526) for fastening the article into a shape similar to underpants. The waist belt (321; 521) comprises a first fastening member (301; 501) having a surface provided with fastening loops (305; 505), said fastening loops (305; 505) being designed to cooperate with a fastening member comprising hook members, and said fastening loops (305; 505)

being arranged in a number of chain-like rows of loops (304; 305), each formed by a continuous thread which penetrates through at least one layer in the waist belt (321; 521), said chain-like rows of loops (304; 504) being arranged principally in the longitudinal direction of the article, at right angles to the direction of extent of the waist belt (321; 521), and in addition a second fastening member (323, 324; 523, 524) is arranged on the end edge of the article opposite the waist belt (321, 521), said second fastening member having hook members which are arranged to cooperate with the first fastening member (301; 501) in order to fasten the article into a shape similar to underpants.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Absorbent article with waistbelt comprising fastening loops
arranged in chain-like rows

5 TECHNICAL FIELD

The invention relates to an absorbent article with a longitudinal direction and a transverse direction, comprising a liquid-permeable cover sheet, a liquid-tight cover sheet, and an absorption body enclosed between the cover
10 sheets, and having two side edges extending in the longitudinal direction and two end edges extending in the transverse direction, which article comprises a waist belt formed by at least one material layer and arranged substantially parallel to an end edge of the article, and having members for fastening the waist belt around a user's waist, and the article comprises
15 members for fastening the article into a shape similar to underpants.

PRIOR ART

It has become increasingly common for diapers and incontinence pads, for
20 example, of the type which are fastened together during use so that the diaper or incontinence pad encloses the user's pelvic area in the manner of absorbent underpants, to be provided with fastening arrangements of the hook-and-loop type. Such a fastening arrangement comprises a fastening member having a surface provided with loop-elements and designed to
25 cooperate with a fastening member having a surface provided with hooks or hook-like projections which can hook securely on the surface provided with loop-elements.

The fastening members of the loop type which have been available to date
30 generally consist of a laminate of a carrier material, for example a plastic film or a nonwoven material and a loop material, for example a loosely knitted or

woven textile material or a loosely bonded nonwoven material. However, a disadvantage of fastening members comprising a plastic layer is that they are not permeable to air and vapor, which means that an absorbent article provided with such a fastening member can be unnecessarily airtight and uncomfortable to wear. This is particularly so in absorbent articles of the belt type, i.e. articles which are held by a belt which is secured around the user's waist. Such an article is advantageously provided with a belt of loop material, which makes it possible to adjust its size. It is desirable in this case that the belt material is smooth, soft and comfortable against the user's skin, that it does not have sharp or hard edges which can chafe the skin, and also that the belt material has a certain breathability and is able to let body moisture and air pass through. It is also desirable for the loop material to be inexpensive so that it can be used for disposable absorbent articles, i.e. those articles which are discarded after a single use and are not washed or reused.

An object of the invention is therefore to make available an absorbent article with a waist belt comprising a fastening member provided with loops, which fastening member is soft and comfortable, air-permeable and vapor-permeable, has high tensile strength and sufficient stiffness to avoid deformation during use, and can be produced in a cost-effective manner.

DISCLOSURE OF THE INVENTION

An article designed according to the invention, and of the type discussed in the introduction, is principally distinguished by the fact that the waist belt comprises a first fastening member having a surface provided with fastening loops, said fastening loops being designed to cooperate with a fastening member comprising hook members, and said fastening loops being arranged in a number of chain-like rows of loops, each formed by a continuous thread which penetrates through at least said material layer included in the waist

belt, said chain-like rows of loops being arranged principally in the longitudinal direction of the article, at right angles to the direction of extent of the waist belt, and in addition a second fastening member is arranged on the end edge of the article opposite the waist belt, said second fastening member having hook members which are arranged to cooperate with the first fastening member in order to fasten the article into a shape similar to underpants.

According to one embodiment of the invention, the waist belt comprises a fastening member provided with hooks members which is arranged in the form of a fastening surface or a fastening flap at one end of the waist belt and which can cooperate with the fastening member provided with loops on the waist belt in order to fasten the waist belt around a user's waist.

A suitable fastening member provided with loops for an article provided with a belt according to the invention is advantageously produced by means of one or more rows of loops being sewn securely into a layered carrier material. This affords several advantages. One advantage is that the fastening loops are anchored in a mechanical manner in the carrier material, which means that it is not necessary to use thermoplastic materials, adhesive or the like to secure the threads in the carrier material. However, it can be expedient for some component in either the thread and/or the carrier material to be thermoplastic, since it is then possible to secure cut-off or clipped-off thread ends by melting the thread end to the carrier material. Such melting can be carried out in conjunction with the fastening member being cut to the right shape and size. Alternatively, it is of course possible to secure the cut-off thread ends with adhesive for example.

A further advantage of the fastening member described above is that it has a high degree of breathability since the carrier material is penetrated by the thread which forms the fastening loops. This makes the fastening member

especially suitable for use in combination with absorbent articles in which the fastening member is arranged over a large area of skin, for example diapers and incontinence pads which, by means of a waist belt, are secured in a shape similar to underpants. It has thus been found to be particularly expedient for the waist belt on such an article to be made up completely or to a large extent of a breathable fastening member provided with loops.

Since the fastening member is produced by means of rows of loops being sewn into a carrier material, it is also possible to increase the bendability of a stiff material so that the material in the waist belt thereby bends more easily along bend lines which run parallel with the rows of loops. Correspondingly, the stiffness of the material increases transverse to the rows of loops. This feature can also be favorable when the fastening member is arranged in the form of a belt along the waist edge of a diaper. If the rows of loops are arranged principally at right angles to the waist edge, this means that the fastening member follows the body and curves around the waist, while ensuring that the material nearest to the waist edge does not bend, roll up or crease. These phenomena often occur when the person using the absorbent article is overweight, and they cause a number of problems. For example, it becomes difficult to fasten the absorbent article. It is also uncomfortable to wear, and the risk of body fluid leaking out of the article increases considerably if the waist edge is folded out onto the outside of the diaper.

Suitable materials for use as carrier material for a fastening member provided with loops are layered materials such as plastic film, nonwoven, or a laminate of two or more layers of plastic film, nonwoven, tissue or the like. The carrier material expediently consists of a single layer of nonwoven with a stiffness of 0.10 – 0.70 N and preferably with a stiffness of 0.35 N, measured according to the CIRCULAR BEND PROCEDURE which is described in EP-A-0 336 578, which publication is hereby included as a

reference. This described method is a modification of ASTM D 4032-82 and involves simultaneous deformation of a material in several directions, one of the surfaces of the specimen becoming concave and the opposite surface becoming convex. The method thus gives a force value which is a measure of the flexural resistance, or the average stiffness in all directions.

Particularly suitable carrier materials are nonwoven materials with a basis weight of from 40 g/m² to 80 g/m². Particularly suitable nonwoven materials are spunbond materials. In an absorbent article according to the invention, the carrier material constitutes all or part of the waist belt. This means that the thread which is sewn through the carrier material and forms the fastening loops can come to lie against the user's skin during use. For the thread to be comfortable against the user's skin, it must therefore be smooth and not too coarse. It is also expedient that the thread is not absorbent, so that liquid cannot be transported in the thread. However, it is possible to use absorbent thread material such as viscose and cotton. The absorption properties of the thread are of less importance in some designs, for example when the waist belt consists of two halves projecting from the side edges of the article. In such an embodiment, it is unlikely that the belt will come into contact with body fluid delivered to the article. Alternatively, the thread can be made of nylon, polyester, polyethylene, polypropylene or the like. Voluminous threads comprising many substantially parallel fibers are preferred, and the thread's combined coarseness should be approximately 20 – 90 deniers.

The fastening loops expediently have a length of 2 – 10 millimeters. The length of a fastening loop refers to the distance between two points of penetration in a row of loops.

The loops of the fastening member are expediently arranged in substantially parallel rows with a spacing of 1 – 10 mm between the rows. It can also be advantageous to arrange rows of loops in groups of two or more rows with a

greater spacing between the groups than between the rows included in the groups. By grouping the rows of loops, it is possible to obtain a waist belt having zones with different properties, for example different fastening capacity, different breathability, and different stiffness. The rows of loops can thus be distributed uniformly across the entire surface of the waist belt. Alternatively, the rows of loops can be provided only on those parts of the waist belt which are expected to be used for fastening the article. In such an embodiment, the rows of loops are thus located at the free end portions of the waist belt and thus form at least one group of at least two rows of loops at each end portion.

According to a further embodiment, the fastening member comprises at least two groups of rows of loops, said rows of loops within the groups being located at a mutual spacing of 1 – 10 mm, and the spacing between the groups being greater than the spacing between the rows of loops in the groups, namely 5 – 100 mm.

The waist belt can either consist of a continuous and contiguous band of material or of two belt halves which project principally at right angles from each side edge at one end edge of the article. A contiguous waist belt is intended to signify a belt which extends along the whole waist edge of the article and thus comes to extend the whole way round the user's waist when the article is in use. Such a waist belt can, however, consist of several parts which are joined together and have different properties.

As will be evident from the above, the waist belt can be made of different types of material in different parts of the belt. Thus, the end portions of the belt can consist of a perforated material which is provided with loops and which permits fastening and stiffening, while a portion of the belt situated centrally between the end portions can differ in terms of properties such as elasticity, compressibility, breathability, stiffness or the like. The belt can

have different properties in different areas depending on the closeness between the rows of loops, the size of the loops, etc. Alternatively, the belt can consist of parts which have different properties from each other and which have been joined together to form a contiguous waist belt, or belt
5 halves.

To make it easier to anchor cut-off thread ends and to prevent the rows of fastening loops from being unraveled, it is advantageous if the thread and/or the carrier material comprises a thermoplastic component which can be used
10 for thermally bonding the thread ends in the carrier material.

BRIEF DESCRIPTION OF THE FIGURES

The invention will now be described in greater detail with reference to the
15 illustrative embodiments shown in the attached drawings, in which:

Figure 1 shows a fastening member provided with loops,

Figure 2 shows in detail a row of loops on the fastening member in Figure 1,
20

Figure 3 shows a plan view of a belted diaper according to the invention, seen from the side which is directed away from the user during use,

Figure 4 shows the diaper from Fig. 3 as it appears when it has been
25 fastened up, and

Figure 5 shows a diaper according to a second embodiment of the invention.

DETAILED DESCRIPTION OF EMBODIMENTS

30

Referring to Figure 2, this shows, on a greatly enlarged scale, an area of a fastening member 101 provided with loops and comprising a carrier material 102 which has a thread 103 forming a chain-like row 104 of fastening loops 105 on a first surface 106 of the carrier material 102, which fastening loops
5 105 are linked together by a row of thread elements 107 which form straight stitches on the opposite, second surface 108 of the carrier material.

The carrier material 102 consists of a layer material, such as plastic film, nonwoven, or a laminate of two or more layers of plastic film, nonwoven,
10 tissue or the like. The carrier material expediently consists of a layer of a nonwoven with a stiffness of 0.10 – 0.70 N, and preferably with a stiffness of 0.35 N, measured according to the CIRCULAR BEND PROCEDURE which is described in EP-A-0 336 578. A particularly preferred material, with a stiffness suitable for the purpose, has been found to be a spunbond material
15 with a grammage of at least about 60 g/m² and preferably about 80 g/m².

The thread which forms the fastening loops 105 can be of any suitable material and can comprise synthetic and/or natural fibers. Thus, it is possible to use fibers of polyethylene, polypropylene, polyester, polyamide or two-
20 component fibers such as cotton fibers, jute, flax, etc. The thread is advantageously bulky and comprises in cross section a plurality of thin and substantially parallel fibers. It is also advantageous if the fibers have a certain curl since this increases the bulkiness and increases the thread's ability to cooperate with a hook member for fastening an absorbent article.

25

The fastening member 101 comprises a plurality of rows 104 of fastening loops 105, as is shown in Figure 1.

Figures 3 and 4 show a diaper 300 with a substantially rectangular plane shape. The diaper 300 is seen from the side which is intended to be directed
30 away from the user during use. The diaper comprises, in a conventional

manner, a liquid-permeable cover sheet 311, a liquid-tight cover sheet 312, and an absorption body 313 enclosed between the cover sheets 311, 312.

The liquid-permeable cover sheet 311 has the same shape as the absorption
5 body 313. The liquid-tight cover sheet 312 is also shaped like the absorption body. However, the cover sheets 311, 312 have a slightly greater planar extent than the absorption body 313 and form a connecting edge 314 projecting around the periphery of the absorption body 313. The cover sheets 311, 312 are connected to each other around the absorption body,
10 for example by adhesive bonding, stitching, or welding with heat or ultrasound. One or both cover sheets 311, 312 can also be connected to the absorption body 313, for example by adhesive bonding, pinning, stitching, or welding with heat or ultrasound.

15 The liquid-permeable cover sheet 311 is of a conventional type and can thus consist of any liquid-permeable material suitable for the purpose. Examples of such materials are different types of thin nonwoven material, perforated plastic films, net material, liquid-permeable foam material or the like. The liquid-permeable cover sheet 311 can be made up of two or more different
20 materials in order to permit different functions of the cover sheet. For example, it is common to arrange a liquid-transporting layer inside a liquid admission layer. It is also known to arrange different types of material on different parts of that surface of the diaper which is directed towards the user during use. Thus, a material with a good admission capacity can
25 advantageously be arranged on that portion of the diaper which is expected to be first wetted by most of the body fluid, while portions of the cover sheet which are located at a distance from the first wetted area can be designed with a barrier function in order to prevent absorbed liquid from leaking out of the diaper.

Nor is it necessary to the invention for the liquid-permeable cover sheet 311 to consist of a separate material layer, and instead the cover sheet 311 can be a surface of the absorption body 313 of the diaper 300.

5 The liquid-tight cover sheet 312 can also be made of any suitable material available. Particularly advantageous materials are thin plastic films, liquid-tight nonwoven material, or material which has been coated with liquid-tight material such as wax, resin, glue or the like. It is also possible to use liquid-tight material laminates. For example, it can be desirable to provide the rear
10 side of the diaper with an outer layer of textile character, for example a nonwoven layer. Such a nonwoven material provides a soft, skin-friendly textile surface and gives advantages such as a high degree of user comfort, high friction and, consequently, a better hold on the articles of clothing worn outside the diaper. In addition, a textile surface is often found to have an
15 esthetically attractive appearance. It is also advantageous if the liquid-tight cover sheet 312 is able to breathe, i.e. allow gas and water vapor to pass through the layer.

The absorption body 313 can also be designed in a conventional manner
20 and using conventional material. Suitable absorbent materials for use in the absorption body 313 are, for example, cellulose fluff pulp, absorbent bonded fiber layers, tissue layers, absorbent foam, peat or the like. The absorption body 313 can also advantageously contain superabsorbent polymers, i.e. polymers having the ability to absorb several times their own weight of liquid
25 and form a liquid gel. Superabsorbents are generally used in the form of particles, flakes, fibers, granules or the like. The superabsorbent material can be present on its own, or together with another absorbent material and arranged as layers, or in the form of a mixture with other materials such as cellulose fibers or synthetic fibers.

As has already been mentioned, the diaper 300 in Figures 3 and 4 is substantially rectangular in shape and has two straight side edges 315, 316 and two likewise straight end edges 317, 318.

- 5 Elastic members 319, 320 are arranged along the side edges 315, 316 and form leg elastics when the diaper 300 is in use. Suitable elastic members are various types of elastic threads, bands, elastic nonwovens, elastic foam material or the like.
- 10 The diaper 300 is also provided with a two-part waist belt 321a,b which is arranged with a belt half 321a,b projecting at right angles from each side edge 315, 316 near the rear end edge 318 of the diaper. The belt halves 321a,b expediently consist of strips of nonwoven material having a large number of parallel chain-like rows 304 of fastening loops 305 forming a
- 15 fastening member 301, provided with loops, of the type shown in Figures 1 and 2. However, as has been described earlier, the fastening member 301 can alternatively consist of a plastic film or laminate material. The fastening member 301 can also be laminated to a further material layer whose main purpose is to give the waist belt a desired property such as improved
- 20 softness and comfort, greater tensile strength and more esthetically attractive appearance, a certain elasticity, a certain absorbency, etc. The chain-like rows 304 of fastening loops are arranged on that surface of the waist belt 321a,b which is directed away from the user when the diaper 300 is being used, i.e. the surface which in Figure 3 is directed towards the
- 25 viewer. The rows 304 of fastening loops 305 are also arranged transverse to the waist belt 321a,b, in the longitudinal direction of the diaper 300.

- To ensure that the diaper 300 can be fastened together into a garment similar to underpants when in use, the diaper is additionally provided with
- 30 fastening members 322, 323, 324 which have hook members. One fastening member 322 provided with hooks is in this case arranged on the free end

350 of one belt half 321a, on that surface which is directed away from the fastening member 301 provided with loops. Fastening flaps 325, 326 are also arranged projecting from the side edges 315, 316 at the front end edge 317. The fastening flaps 325, 326 have fastening members 323, 324
5 provided with hooks on that surface which is directed away from the viewer of Figure 3, i.e. the surface which is directed towards the user when the diaper is in use.

In this context, hook members are intended to signify all existing types of
10 hooks, catches and projections which can hook into the loops 305 on the fastening member 301 provided with loops.

When it is being used, the diaper 300 is secured around the lower part of the user's trunk and then assumes the shape shown in Figure 4. This is done by
15 means of the free end portions 350, 351 of both halves 321a,b of the waist belt being brought together around the user's waist and by means of the fastening member 322, provided with hooks, on one belt half 312a of the waist belt being secured in the fastening loops on the other belt half 321b. The front end edge 317 of the diaper is then guided forwards between the
20 user's legs and secured by means of the fastening members 323, 324, provided with hooks, on the fastening flaps 325, 326 being applied against the fastening member 301, provided with loops, on the waist belt 321a,b.

The diaper 500 shown in Figure 5 is also viewed from the side directed away
25 from the user during use and comprises, in a corresponding manner, a liquid-permeable cover sheet 511, a liquid-tight cover sheet 512, and an absorption body 513 enclosed between the cover sheets 511, 512. The diaper is substantially hourglass-shaped, with a front portion and a rear portion 531, 532 and with an intermediate narrower crotch portion 533. The
30 diaper also has two curved side edges 515, 516 which are designed to form rounded openings around a user's legs when the diaper is fitted on the user,

and a front and a rear end edge 517, 518 which, during use, together form the waist edge of the diaper. The diaper 500 additionally has elastic members 519, 520 arranged along the curved side edges and intended to gather the diaper together around the user's legs so that a tight fit is
5 obtained around the legs. Elastic members 534 are correspondingly arranged along the rear end edge 518 in order to obtain a good fit around the user's waist.

The diaper 500 shown in Figure 5 also has a waist belt 521 comprising a
10 fastening member 501 provided with loops. However, in contrast to the diaper shown in Figures 3 and 4, the diaper 500 in Figure 5 has a continuous waist belt 521 which extends along the entire rear edge 518 of the diaper 500 and extends in the transverse direction past the side edges 515, 516 of the diaper via portions 521a, 521b which are sufficiently long for
15 the waist belt 512 to be able to reach round a user's waist. The elastic members 534 on the rear waist edge 518 are in this case arranged in the waist belt 521. As can be seen from the figure, the fastening member 501 provided with loops is arranged in the form of a multiplicity of rows 504 of loops which extend across the waist belt via the free end portions 550, 551
20 of its two projecting portions 521a, 521b. The rows 504 of loops are arranged in the areas 555, 556 of the waist belt 521 which are expected to be used for fastening the diaper 500 together. A further area 557, 558 of rows of loops is also arranged on both sides of the elastic members 534 at the rear waist edge 518 in order to prevent the waist belt 521 from creasing
25 up or being folded within the elastic area.

It should be pointed out in this connection that the invention is of course not limited to the examples shown in Figures 3 – 5 in terms of how the rows 304, 504 of loops can be arranged on a waist belt. It is thus possible to conceive
30 of rows of loops being grouped in another way than that shown in Figure 5. For example, the whole waist belt, or at least those portions which are

intended to be used for fastening, can be provided with groups of 2 – 20 rows of loops alternating with areas which are free from rows of loops. The free areas in this case have a width which exceeds the spacing between the rows of loops within the groups and is expediently between 5 and 100 mm.

- 5 The rows 304, 504 of loops perform the dual function of serving as fastening members and as stiffening/stabilizing members for the waist belt 321a,b, 521 in order to prevent rolling and folding.

- 10 So that the diaper 500 can be fastened together into a garment similar to underpants when in use, a fastening member in the form of a fastening flap 522 and having hook members is arranged at the free end of one projecting portion 521a of the waist belt 521. The fastening flap is arranged with the hook members on that surface which is directed away from the fastening members 501, provided with loops, of the waist belt. Fastening members in
15 the form of fastening surfaces 525, 526 are also arranged projecting inside the side edges 515, 516 near the front end edge 517. The fastening surfaces 525, 526 have fastening members 523, 524, provided with hooks, on that surface which is directed away from the person studying Figure 5, i.e. the surface which is directed towards the user when the diaper is in use.

20

- When it is being used, the diaper 500 is secured around the lower part of the user's trunk in the same way as the diaper in Figures 3 and 4 and then assumes the appearance of underpants. This is done by means of the two projecting portions 521a, 521b of the waist belt being brought together
25 around the user's waist and by means of the fastening flap 522, provided with hooks, on one projecting portion 521a of the waist belt 521 being secured in the fastening loops on the other projecting portion of the waist belt 521. The front end edge 517 of the diaper is then guided forwards between the user's legs and secured by means of the hook members 523,
30 524 on the fastening surfaces 525, 526 against the fastening member 501, provided with loops, on the waist belt 521.

The arrangement shown in Figure 5 with fastening surfaces 525, 526, provided with hooks, placed at the corners between the rear end edge 518 and the side edges 515, 516 on the liquid-permeable cover sheet 511 of the
5 diaper 500 can of course be replaced by fastening flaps as are shown in Figures 3 and 4. Likewise, the fastening member 522, provided with hooks, on the waist belt can be designed in the same way as in the case of the diaper in Figures 3 and 4. Conversely, of course, the diaper 300 in Figures 3 and 4 can have fastening surfaces 322, 325, 326, provided with hooks,
10 arranged in the manner shown in Figure 5. According to yet another alternative, the fastening members 325, 326; 525, 526 at the front end edge 317, 517 of the diapers shown in the figures can be designed as a single continuous fastening area, provided with hooks, or as a plurality of fastening areas arranged along the front end edge 317; 517.

CLAIMS

1. An absorbent article with a longitudinal direction and a transverse direction (300; 500), comprising a liquid-permeable cover sheet (311; 511), a liquid-tight cover sheet (312; 512), and an absorption body (313; 513) enclosed between the cover sheets (311, 312; 511, 512), and having two side edges (315, 316; 515, 516) extending in the longitudinal direction and two end edges (317, 318; 517, 518) extending in the transverse direction, which article comprises a waist belt (321a,b; 521) formed by at least one material layer and arranged substantially parallel to an end edge (318; 518) of the article, and having members (301, 322; 501, 522) for fastening the waist belt around a user's waist, and the article comprises members (301, 325, 326; 501, 525, 526) for fastening the article into a shape similar to underpants, characterised in that the waist belt (321; 521) has two free ends (350, 351; 550, 551) each comprising a first fastening member (301; 501) having a surface provided with fastening loops (305; 505), said fastening loops (305; 505) being designed to cooperate with a fastening member comprising hook members, and said fastening loops (305; 505) being arranged in a number of chain-like rows of loops (304; 305), each formed by a continuous thread which penetrates through at least said material layer included in the waist belt (321; 521), said chain-like rows of loops (304; 504) being arranged principally in the longitudinal direction of the article, at right angles to the direction of extent of the waist belt (321; 521), and wherein in addition a second fastening member (323, 324; 523, 524) is arranged on the end edge of the article opposite the waist belt (321; 521), said second fastening member having hook members which are arranged to cooperate with the first fastening member (301; 501) in order to fasten the article into a shape similar to underpants.
2. The absorbent article as claimed in claim 1, wherein the waist belt (321a,b; 521) comprises a fastening member provided with hooks which is

arranged in the form of a fastening surface (322) or a fastening flap (522) at a free end (350, 351; 550, 551) of the waist belt (321a,b; 521) and which can cooperate with the fastening member (301; 501) provided with loops on the waist belt (321a,b; 521) in order to fasten the waist belt (321a,b; 521) around
5 a user's waist.

3. The absorbent article as claimed in claim 1 or 2, wherein the waist belt (321a,b; 521) comprises a nonwoven material with a basis weight of 40 g/m² to 80 g/m².
10

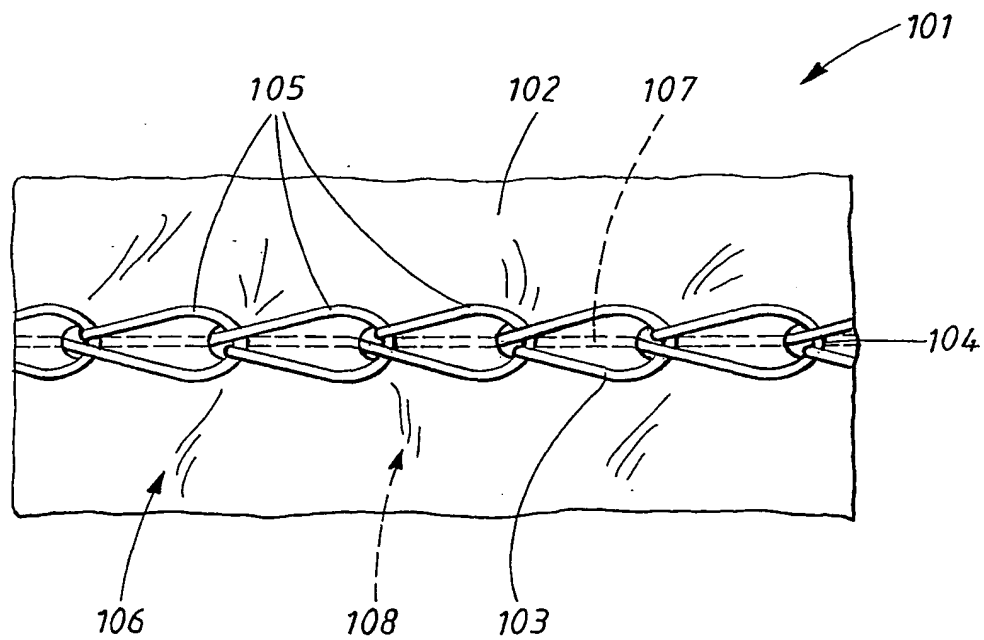
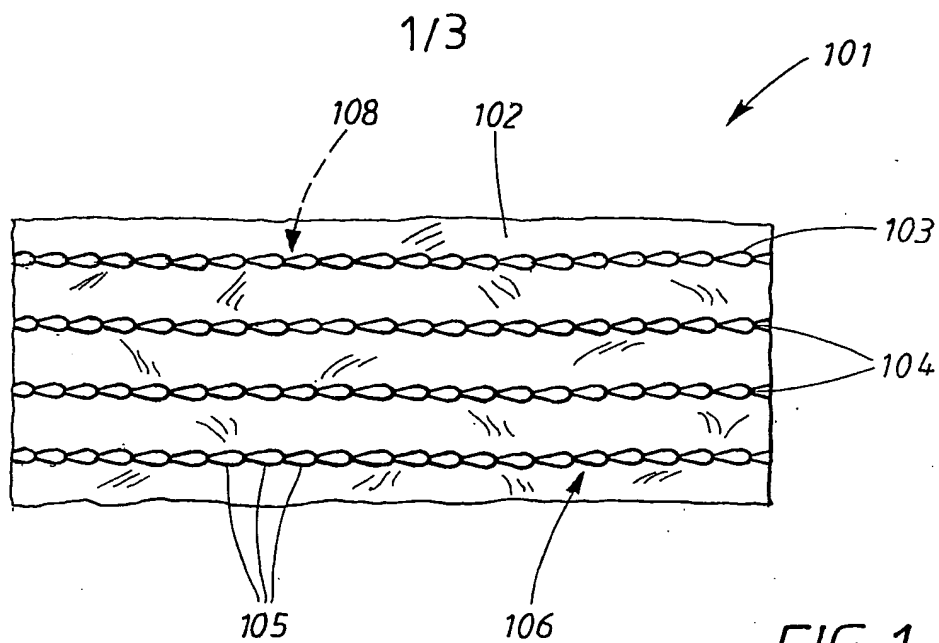
4. The absorbent article as claimed in any of the preceding claims, wherein the fastening loops (305; 505) have a length of 2 – 10 mm.

5. The absorbent article as claimed in any of the preceding claims, wherein the rows (304) of loops are uniformly distributed across the whole surface of the waist belt (321a,b), and wherein the spacing between the rows (304) of loops is 1 – 10 mm.
15

6. The absorbent article as claimed in any of claims 1 - 4, wherein the fastening member (301) has at least one group of rows (304; 504) of loops, said group comprising at least two rows (304; 504) of loops.
20

7. The absorbent article as claimed in claim 6, wherein each belt end (350, 351; 550, 551) has at least two groups of rows (304; 504) of loops, and wherein the rows (304; 504) of loops within the groups are situated at a spacing of 1 – 10 mm from each other and the spacing between the groups is greater than the spacing between the rows (304; 504) of loops within the groups and is 5 – 100 mm.
25

8. The absorbent article as claimed in any of the preceding claims, wherein the waist belt (521) consists of a continuous integral band of material.
- 5 9. The absorbent article as claimed in any of claims 1 - 7, wherein the waist belt (321a,b) consists of two belt halves (321a,b) which project substantially at right angles from each side edge (315, 316) at one end edge (318) of the article.
- 10 10. The absorbent article as claimed in any of the preceding claims, wherein the thread which forms the rows of loops has a coarseness of 20 – 90 deniers.
11. The absorbent article as claimed in any of the preceding claims,
15 wherein the waist belt (321a,b; 521) at least partially consists of a nonwoven material with a stiffness of 0.10 – 0.70 N and preferably with a stiffness of 0.35 N measured according to a modified version of ASTM D 4032-82, CIRCULAR BEND PROCEDURE.



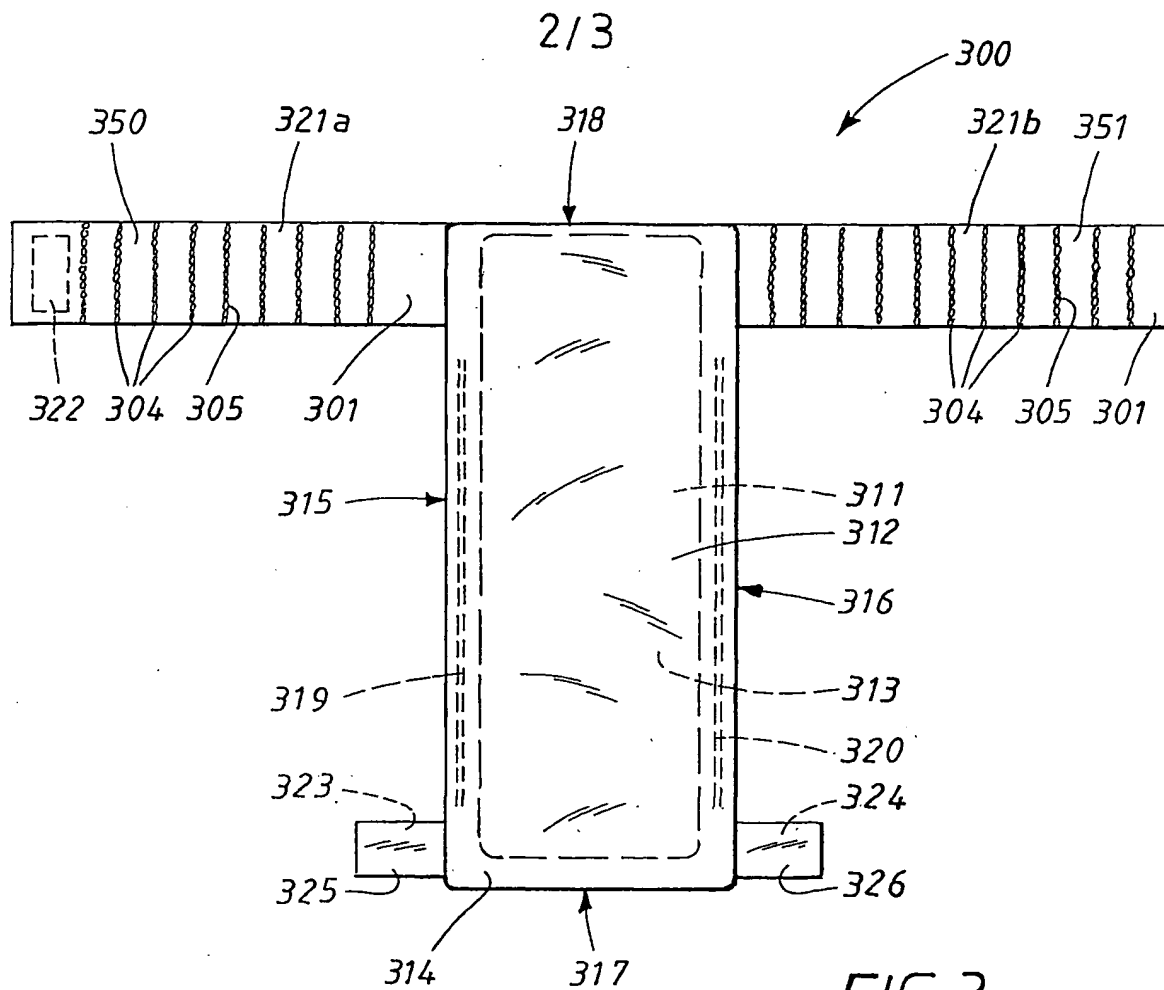


FIG. 3

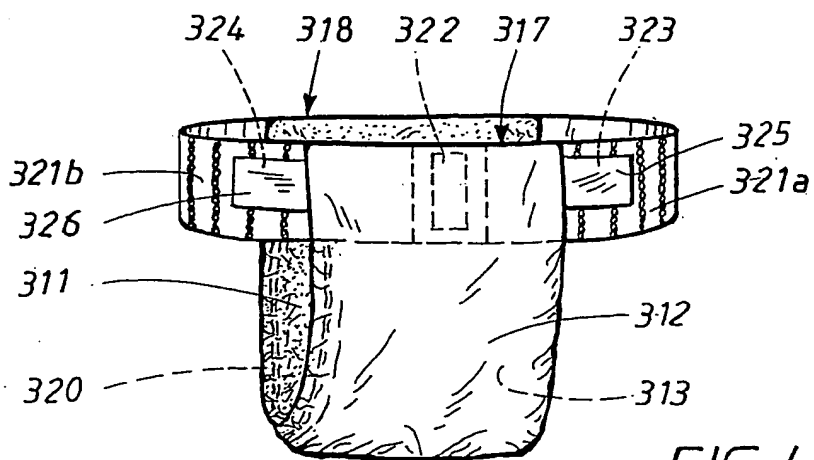
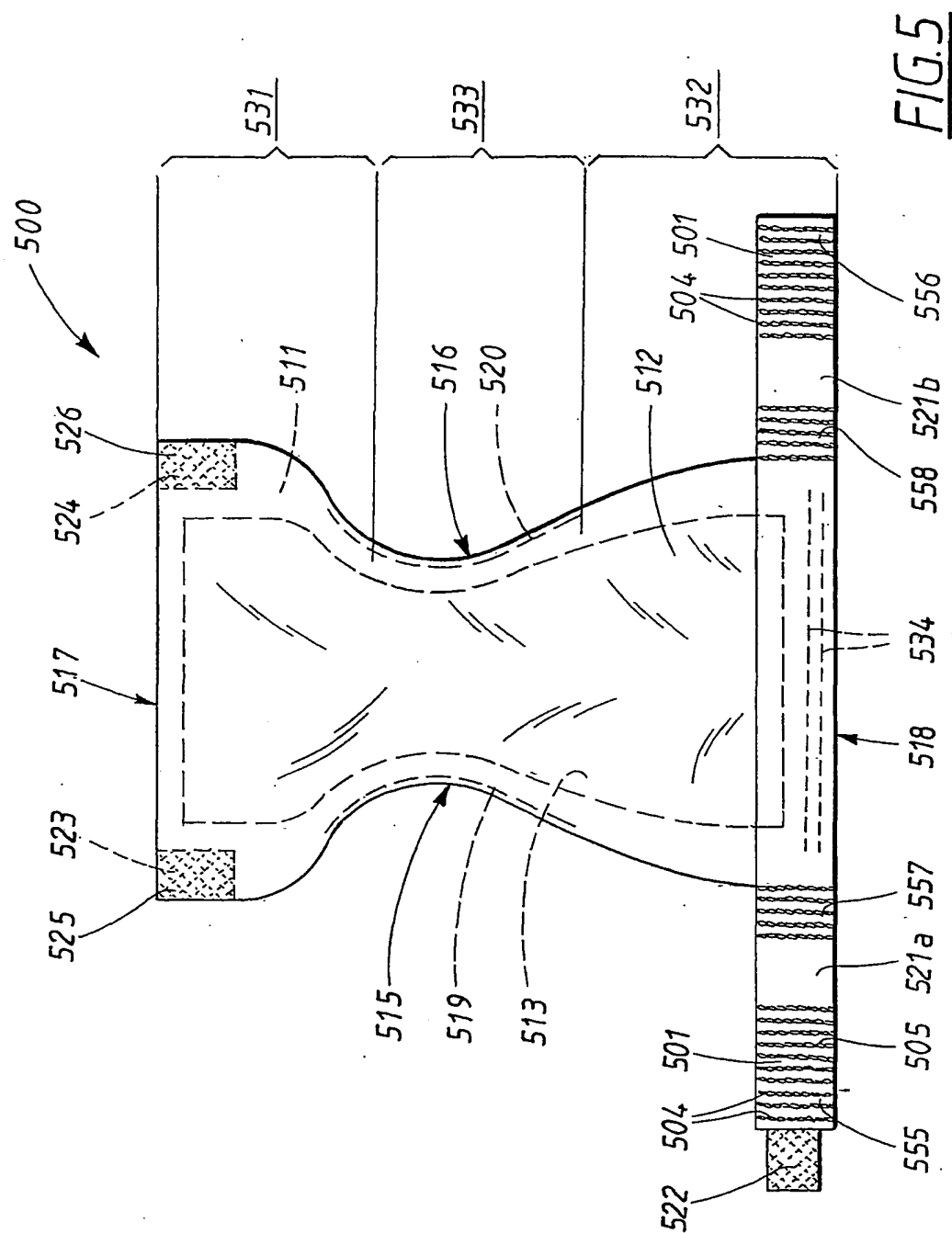


FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 01/02009

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61F 13/62, A61F 13/64

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A44B, D04B, A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0409307 A2 (THE PROCTER & GAMBLE COMPANY), 23 January 1991 (23.01.91), column 4, line 58 - column 5, line 36, figure 1 --	1-11
Y	EP 0589395 A1 (YOSHIDA KOGYO K.K.), 30 March 1994 (30.03.94), column 3, line 5 - line 12; column 4, line 26 - line 41, figure 6 --	1-11
A	US 1388529 A (G.B. SMITH), 23 August 1921 (23.08.21) --	1-11
A	WO 9817140 A1 (MILLIKEN FABRICS S.A.), 30 April 1998 (30.04.98) --	1-11

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

21 November 2001

Date of mailing of the international search report

05 -12- 2001

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 01/02009

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	FR 2794348 A1 (DUFLOT ACHILLE), 8 December 2000 (08.12.00) -----	1-11

INTERNATIONAL SEARCH REPORT

Information on patent family members

06/11/01

International application No.

PCT/SE 01/02009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP	0409307	A2	23/01/91	SE 0409307 T3
				AT 142472 T 15/09/96
				AU 647743 B 31/03/94
				AU 655735 B 05/01/95
				AU 5515094 A 05/05/94
				AU 5905490 A 24/01/91
				BR 9003479 A 27/08/91
				CA 2019880 A,C 18/01/91
				CN 1028602 B 31/05/95
				CN 1048798 A 30/01/91
				DE 69028459 D,T 06/02/97
				DK 409307 T 03/03/97
				EG 18823 A 28/02/94
				ES 2091786 T 16/11/96
				FI 100378 B 00/00/00
				FI 903606 D 00/00/00
				GR 3021462 T 31/01/97
				IE 74190 B 16/07/97
				IE 902604 A 27/02/91
				JP 3136652 A 11/06/91
				KR 180011 B 01/04/99
				NZ 234548 A 27/09/93
				PT 94716 A,B 20/03/91
				TR 27286 A 26/12/94
				US 5445628 A 29/08/95
				US 5454803 A 03/10/95
EP	0589395	A1	30/03/94	BR 9303528 A 28/06/94
				CA 2106541 A,C 22/03/94
				CN 1086983 A 25/05/94
				DE 69309210 D,T 09/10/97
				ES 2099880 T 01/06/97
				HK 125197 A 12/09/97
				JP 2095095 C 02/10/96
				JP 5154352 A 22/06/93
				JP 8004714 B 24/01/96
				KR 9601083 Y 07/02/96
				SG 44902 A 19/12/97
				US 5373712 A 20/12/94
US	1388529	A	23/08/21	NONE
WO	9817140	A1	30/04/98	AU 5120698 A 15/05/98
				EP 0934010 A 11/08/99
				JP 2001506515 T 22/05/01
FR	2794348	A1	08/12/00	NONE